

## CLAIMS

1. A method for extracorporeal oxygenation of a patient's blood during cardiopulmonary bypass surgery, the method comprising:
  - receiving venous blood from a patient into venous line means;
  - pumping venous blood through an air filter connected to said venous line means by means of a first vacuum, generated by a first pump means, the air filter comprising an air chamber;
  - diverting air entering said air filter into said air chamber;
  - sensing bubbles in the venous blood;
  - applying a second vacuum to said air chamber, for drawing air from said air chamber, only when bubbles are sensed in the venous blood;
  - pumping blood exiting the air filter through the first pump means and through blood oxygenating means to oxygenate the blood; and
  - returning the blood oxygenated by said blood oxygenating means to an arterial system of said patient.
2. The method according to claim 1 further comprising delivering the air drawn from said air chamber to a cardiotomy reservoir.
3. The method according to claim 2 further comprising applying a third vacuum to said cardiotomy reservoir for drawing blood from said cardiotomy reservoir and for supplying the blood to the venous line means.
4. The method according to claim 2 or 3 further comprising applying a fourth vacuum to said cardiotomy reservoir for drawing air from said cardiotomy reservoir.
5. The method according to one of claims 1, 2, 3 or 4 further comprising generating the second vacuum by a second pump means and actuating the second pump means only when bubbles are

sensed in the venous blood.

6. The method according to one of claims 1, 2, 3, 4 or 5, wherein venous blood is not collected in a venous reservoir.
7. Apparatus for extracorporeal oxygenation of a patient's blood during cardiopulmonary bypass surgery, the apparatus comprising:
  - venous line means for receiving venous blood from a patient;
  - bubble sensing means, arranged at or connected to said venous line means, for detecting bubbles in the venous blood received from said patient;
  - air filter means, connected to the venous line means and arranged downstream of said bubble sensing means, for separating air from blood, the air filter means comprising an air chamber for receiving air and means for diverting the air entering said air filter means into said air chamber;
  - blood oxygenating means for oxygenating blood after passing through the air filter means;
  - arterial line means for returning blood to the arterial system of said patient after the blood has been oxygenated by the blood oxygenating means;
  - first pump means, defining a first vacuum, for pumping blood through said venous line, said air filter means, said the blood oxygenating means and said arterial line means; and
  - second pump means, defining a second vacuum, to draw air from the air chamber of said air filter means only when bubbles are detected in the venous blood by the bubble sensing means.
8. Apparatus according to claim 7, wherein an outlet port of said second pump means is connected to a cardiotomy reservoir, said cardiotomy reservoir being connected to said venous line means upstream of said bubble sensing means.

9. Apparatus according to claim 7 or 8, wherein a third pump means is provided for defining a third vacuum which is applied to said cardiotomy reservoir for drawing blood from said cardiotomy reservoir and for supplying blood from the cardiotomy reservoir to the venous line means.
10. Apparatus according to claim 7, 8 or 9, wherein a fourth vacuum is applied to said cardiotomy reservoir for drawing air from said cardiotomy reservoir.
11. The method according to one of claims 7, 8, 9 or 10 wherein said bubble sensing means are connected to said second pump means for actuating said second pump means only when bubbles are sensed in the venous blood.